MERCURY MARINER

Service Bulletin

Bulletin No. 2009-03
OEM No. 2009-03

Circulate to: ☐ Sales Manager ☐ Accounting ☑ Service Manager ☑ Technician ☑ Parts Manager

Power Steering Pump/Module Electrical Troubleshooting – Outboard Boat Mounted Pump

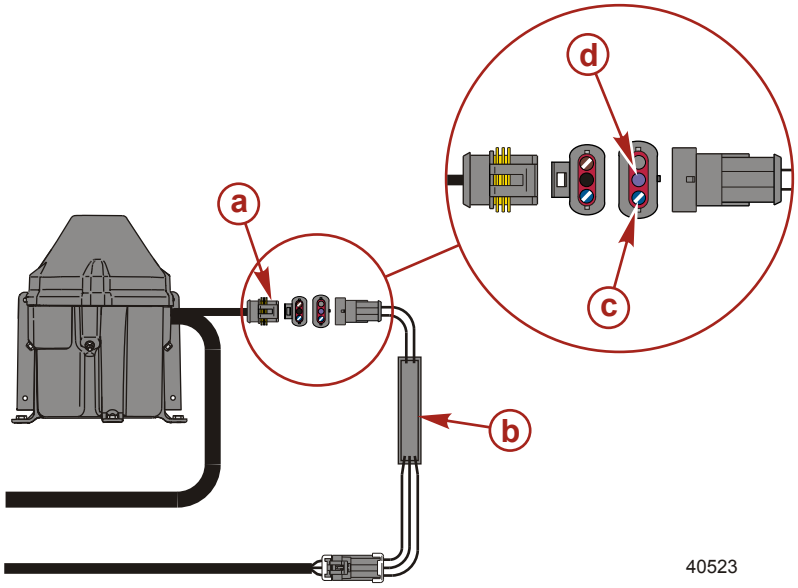
Troubleshooting an Inoperable Power Steering Pump

1. Verify that battery cables, power steering pump signal harnessing, and driver module are installed according to the engine's installation/service manual architecture.
2. Verify that battery voltage is present on the battery cables leading to the power steering pump (be sure to check the voltage on the power steering pump side of the fuse located on the positive cable).
   a. When battery voltage is present on these leads, indicating a good fuse, the power steering pump will actuate when the expected voltage is completed from the power steering signal harness/driver module. This voltage is sent in a two-step process: Step 1 - key on then Step 2 - engine starts and runs.
      - The power steering pump may ramp-up slowly if this two-step process is not performed as instructed.
      - The power steering pump will not actuate unless the engine is running.

THE INFORMATION IN THIS DOCUMENT IS CONFIDENTIAL AND PROTECTED BY COPYRIGHT AND IS THE PROPERTY OF MERCURY MARINE.

This document is provided for the sole and exclusive use of the original recipient as prescribed by Mercury Marine and may not be distributed or copied, digitally or otherwise, without the prior written consent of Mercury Marine.

3. Check for proper voltage across the power steering driver module. To test, break the connection point between the driver module and the power steering pump wiring.



a - Power steering pump harness connector
b - Power steering driver module
c - Pin 1 (blue/white)
d - Pin 2 (purple)

a. With the key in the off position, no voltage should be present across the blue/white to purple wire or across either of these wires to ground.

b. With the key on and the engine off, battery voltage must be present across the purple lead and the engine/battery ground.

- There should be less than 1 volt (< 1 volt) across the blue/white wire and battery ground.

DMT Meter Leads			
	Red	**Black**	**Circuit voltage =**
Power steering driver module - key on and engine off	Purple	Engine/battery ground	Battery voltage
	Blue/white	Engine/battery ground	< 1 volt

c. With the engine running, battery voltage should be present across the blue/white lead and engine/battery ground and across the purple lead to the engine/battery ground.

DMT Meter Leads			
	Red	**Black**	**Circuit voltage =**
Power steering driver module - engine starts and runs	Purple	Engine/battery ground	Battery voltage
	Blue/white	Engine/battery ground	Battery voltage

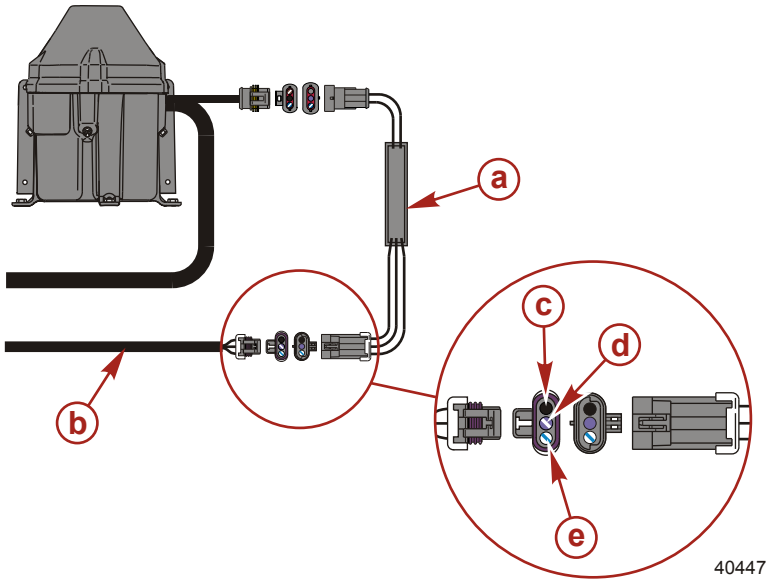
- If these voltages are not observed, as listed, with a good battery and key switch harness, continue with testing the power steering signal harness circuit.

THE INFORMATION IN THIS DOCUMENT IS CONFIDENTIAL AND PROTECTED BY COPYRIGHT AND IS THE PROPERTY OF MERCURY MARINE.

This document is provided for the sole and exclusive use of the original recipient as prescribed by Mercury Marine and may not be distributed or copied, digitally or otherwise, without the prior written consent of Mercury Marine.

- If the voltages are correct across the driver module, the power steering pump may be the problem. Use the **Power Steering Module Primer Kit** to confirm a power steering pump failure.

4. Check for proper voltage across the power steering signal harness. To test, break the connection point between the signal harness and the driver module.



a - Power steering driver module
b - Power steering signal harness - to engine
c - Pin A (black)
d - Pin B (purple/white)
e - Pin C (white/blue)

NOTE: *These procedures cover a single engine application. A multi-engine signal harness adapter will be installed on boats powered by multiple outboards. Be sure to check for voltages listed before and after the multi-engine adapter harness.*

a. With the key in the off position, no voltage should be present across any wire pair of the three signal harness wires or across any of these wires to ground.

b. With the key on and the engine off, battery voltage should be present across the purple/white and black wires.

- There should be less than 1 volt (< 1 volt) between the purple/white and white/blue wires.

DMT Meter Leads			
	Red	**Black**	**Circuit voltage =**
Power steering signal harness - key on and engine off	Purple/white	Black	Battery voltage
	Purple/white	White/blue	< 1 volt

c. With the engine running, battery voltage should be present across the purple/white and white/blue wires as well as across the purple/white and black wires.

THE INFORMATION IN THIS DOCUMENT IS CONFIDENTIAL AND PROTECTED BY COPYRIGHT AND IS THE PROPERTY OF MERCURY MARINE.

This document is provided for the sole and exclusive use of the original recipient as prescribed by Mercury Marine and may not be distributed or copied, digitally or otherwise, without the prior written consent of Mercury Marine.

DMT Meter Leads			
	Red	Black	Circuit voltage =
Power steering signal harness - engine starts and runs	Purple/white	Black	Battery voltage
	Purple/white	White/blue	Battery voltage

- If these voltages are not observed, as listed, with a good battery and key switch harness, check for the same voltages at the engine wire harness which connects to the signal harness. If the listed voltages are still not present, a problem may exist within the 3 wire circuit on the engine wire harness or the PCM. With the PCM disconnected, complete an ohms/continuity check on these wires. If the circuits have no shorts to ground and less than one ohm of resistance, a PCM may be the problem.

NOTE: Verado engines (except 350 SCi Verado): *The power steering signal harness is located at the lower starboard side of the powerhead near the rigging tube.*

NOTE: 350 SCi Verado: *The power steering signal harness is combined with the 8 pin boat harness. The power steering harness wiring colors match throughout the system.*

Power Steering Module Primer Kit

If the power steering pump is inoperable, a great way to test the power steering pump directly is to utilize the power steering primer module to bypass the engine and all boat harnessing. With battery power hooked to the power steering pump and the primer module installed, a working power steering pump will operate when the two-stage module is activated in the proper sequence. See the instruction sheet supplied with the power steering primer module kit.

Power Steering Module Primer Kit	91-895040K01
5547	Bleeds power steering system without running engine.

Troubleshooting Tips

Multi-engine boat rigged with Electro-Hydraulic Power Steering

Problem: All engines power-up with the activation of a single key switch.

NOTE: *On installations exhibiting these symptoms, all engines will still start and run normally.*

Symptoms:

- The key-on systems check horn chirp will sound for all engines when the first key is turned on (sounds like one horn sounding). If only one key is turned on, an e-stop activated alarm will sound (six intermittent beeps). This is due to all the engines and/or command modules being powered up, but the remaining key switches are still in the off position.
- When the other keys are turned on, the key-on horn chirp will not sound and the e-stop alarms will clear.

THE INFORMATION IN THIS DOCUMENT IS CONFIDENTIAL AND PROTECTED BY COPYRIGHT AND IS THE PROPERTY OF MERCURY MARINE.

This document is provided for the sole and exclusive use of the original recipient as prescribed by Mercury Marine and may not be distributed or copied, digitally or otherwise, without the prior written consent of Mercury Marine.

Possible problem: Multi-engine power steering adapter harness.

Diagnostic procedure: Remove the multi-engine adapter harness. Connect the power steering signal harness from the starboard/outside engine directly to the power steering pump. Turn the starboard/outside key switch to the run position. If the sister engines no longer power-up with a single key switch, the multi-engine power steering adapter harness is the problem. Replace as necessary.

Part number for replacement multi-engine power steering adapter harness:

- Dual - 892868T01
- Triple - 892868T02
- Quad - 892868T03

THE INFORMATION IN THIS DOCUMENT IS CONFIDENTIAL AND PROTECTED BY COPYRIGHT AND IS THE PROPERTY OF MERCURY MARINE.

This document is provided for the sole and exclusive use of the original recipient as prescribed by Mercury Marine and may not be distributed or copied, digitally or otherwise, without the prior written consent of Mercury Marine.